

INSTRUCTIONS FOR THE COST REDUCTION SLIDE RULE

The cost reduction slide rule was designed as a tool for quickly extrapolating cost estimates from a given set of data. Although its primary use will be for calculating direct fabrication hours it can also be used for shop loading, material pricing and sales price extrapolation. For instruction purposes the following examples are given in terms of fabrication direct hours.

AVERAGE COST EXAMPLES

(use average cost side of rule)

- Given: first unit cost 8,000 hours
quantity 120 units
cost reduction curve 80%

Find: average cost

Operation: Set 8,000 on the C scale opposite the index on the D scale.

Move cursor to 120 on the 80% scale.
Read 1,713 average fabrication hours under the cursor on the C scale.

- Given: quantity 15 units
average cost 50 hours
cost reduction curve 85%

Find: first unit cost

Operation: Set cursor on 15 on the 85% curve.

Set 50 hours on the C scale under the cursor index.
Read 94.3 first unit cost hours on the C scale at the index of the D scale.

Note that the average cost scale for the 78% cost reduction curve is a folded scale.

UNIT COST EXAMPLES

(use unit cost side of rule)

- Given: first unit cost 600 hours
cost reduction curve 83%

Find: cost of 30th unit

Operation: Set 600 hours on the C scale opposite the index on the D scale.

Move cursor to 30 on the 83% scale.
Read 177.30th unit cost hours under the cursor on C scale.

- Given: 1,000th unit cost 40 hours
cost reduction curve 80%

Find: first unit cost

Operation: Set cursor on 1,000 on the 80% scale.

Set 40 hours on the C scale under the cursor index.
Read 548 first unit cost hours on the C scale opposite the index of the D scale.

Note that the unit cost scale for the 78% and 80% cost reduction curve is a folded scale.

MULTIPLY AND DIVIDE

The C and D scale may be used as a conventional slide rule for multiplying and dividing.

COST REDUCTION FORMULA

$$C_a = f n^{-x}, C_u = f n^{1-x} - f (n-1)^{1-x}$$

$$C_a = \text{Average Cost}$$

$$C_u = \text{Unit Cost}$$

$$f = \text{First Unit Cost}$$

$$n = \text{Number of Units}$$

$$x = \text{Exponent for a specific curve as follows:}$$

95% = .074000	83% = .268817
90% = .152003	80% = .321928
85% = .234465	78% = .358454

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